

# New Trend Mathematics (2nd Edition) S2A - Chapter Quiz

## Chapter 7

### Solution

1. (a) Number of S2A students =  $2 + 4 + 8 + 9 + 6 + 1 + 5$  2M  
 $= \underline{\underline{35}}$  2A
  - (b) Most students belong to the class interval 58 kg - 62 kg. 2A
  - (c) Number of students in the class interval 73 kg - 77 kg = 5 2A
  - (d) The required percentage =  $\frac{5}{35} \times 100\%$  2M  
 $= \underline{\underline{14.3\%}}$  (corr. to 3 sig. fig.) 2A
  
2. (a) Cumulative frequency corresponding to the median =  $\frac{200}{2} = 100$  1M  
Median = 95 min 2A
  - (b) Cumulative frequency corresponding to  $P_{20} = 200 \times 20\% = 40$  1M  
 $P_{20} = \underline{\underline{45 \text{ min}}}$  2A  
Cumulative frequency corresponding to  $P_{80} = 200 \times 80\% = 160$  1M  
 $P_{80} = \underline{\underline{120 \text{ min}}}$  2A
  
3. (a) 220 thousand 2A
  - (b) (i) Cumulative frequency corresponding to the lower quartile  
 $= 220 \text{ thousand} \times 25\% = 55 \text{ thousand}$  1M  
Lower quartile = 12.5 cm 2A
    - (ii) Cumulative frequency corresponding to the median  
 $= 220 \text{ thousand} \times 50\% = 110 \text{ thousand}$  1M  
Median = 19.5 cm 2A
    - (iii) Cumulative frequency corresponding to the upper quartile  
 $= 220 \text{ thousand} \times 75\% = 165 \text{ thousand}$  1M  
Upper quartile = 26.5 cm 2A
  - (c) 160 thousand salmon are shorter than 25.5 cm. 1A  
 $\therefore$  The required percentage =  $\frac{220 - 160}{220} \times 100\%$  1M  
 $= \underline{\underline{27.3\%}}$  (corr. to 3 sig. fig.) 2A
  
4. (a) Number of S2A students =  $2 + 6 + 9 + 4 + 6 + 6 + 5 + 2$   
 $= \underline{\underline{40}}$  2A

$$\begin{aligned}\text{Number of S2B students} &= 2 + 5 + 5 + 9 + 14 + 3 + 2 \\ &= \underline{40}\end{aligned}$$

2A

(b) (i)  $\underline{30 - 39}$

2A

(ii)  $\underline{60 - 69}$

2A

(c) (i) The required percentage =  $\frac{6 + 6 + 5 + 2}{40} \times 100\% = \underline{47.5\%}$

2M + 2A

(ii) The required percentage =  $\frac{9 + 14 + 3 + 2}{40} \times 100\% = \underline{70\%}$

2M + 2A

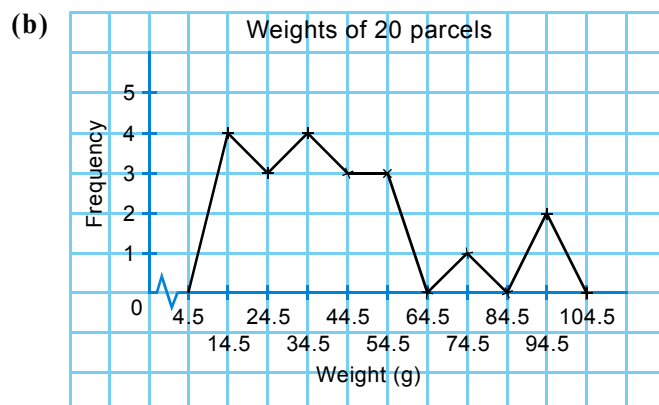
(d)  $\underline{\text{S2B}}$

2A

5. (a)

Weight (g)	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 - 89	90 - 99
Class mark (g)	14.5	24.5	34.5	44.5	54.5	64.5	74.5	84.5	94.5
Frequency	4	3	4	3	3	0	1	0	2

9A



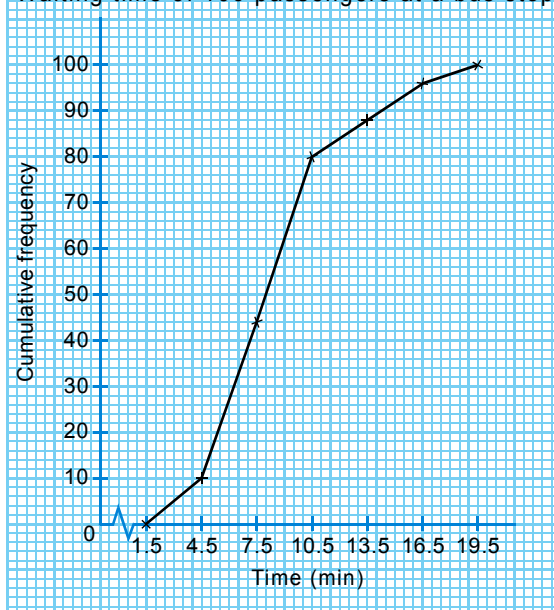
5A

6. (a)

Waiting time less than (min)	1.5	4.5	7.5	10.5	13.5	16.5	19.5
Cumulative frequency	0	10	44	80	88	96	100

8A

(b) Waiting time of 100 passengers at a bus stop



5A

(c) Cumulative frequency corresponding to the median =  $\frac{100}{2} = 50$

1M

Median = 8 min

2A

7. (a) The number of students in each class is 40.

2A

(b) (i) Cumulative frequency corresponding to the lower quartile  
=  $40 \times 25\% = 10$

1M

Lower quartile in S2A = 29 min

1A

Lower quartile in S2B = 53 min

1A

(ii) Cumulative frequency corresponding to the median  
=  $40 \times 50\% = 20$

1M

Median in S2A = 61 min

1A

Median in S2B = 65 min

1A

(iii) Cumulative frequency corresponding to the upper quartile  
=  $40 \times 75\% = 30$

1M

Upper quartile in S2A = 77 min

1A

Upper quartile in S2B = 69 min

1A

(c) For S2A, the difference between the upper quartile and lower quartile  
=  $(77 - 29) \text{ min}$

1M

= 48 min

1A

For S2B, the difference between the upper quartile and lower quartile

$$= (69 - 53) \text{ min}$$

1M

$$= 16 \text{ min}$$

1A

$\therefore$  S2A has a larger difference between the upper quartile and lower quartile.

1A

**Solution**

$$1. (a) \text{ Mean} = \frac{4 + 5 + 10 + 12 + 12 + 13 + 14 + 18}{8} \quad 1M$$

$$= \underline{\underline{11}} \quad 1A$$

$$\text{Median} = \frac{12 + 12}{2} \quad 1M$$

$$= \underline{\underline{12}} \quad 1A$$

$$\text{Mode} = \underline{\underline{12}} \quad 2A$$

$$(b) \text{ Mean} = \frac{101 \times 3 + 103 \times 4 + 104 + 106 + 109 + 110}{11} \quad 1M$$

$$= \underline{\underline{104}} \quad 1A$$

$$\text{Median} = \underline{\underline{103}} \quad 2A$$

$$\text{Mode} = \underline{\underline{103}} \quad 2A$$

(c) Arrange the data in ascending order:

$$4, 8, 8, 10, 17, 18, 18, 22, 30 \quad 1M$$

$$\text{Mean} = \frac{4 + 8 + 8 + 10 + 17 + 18 + 18 + 22 + 30}{9} \quad 1M$$

$$= \underline{\underline{15}} \quad 1A$$

$$\text{Median} = \underline{\underline{17}} \quad 2A$$

$$\text{Modes} = \underline{\underline{8 \text{ and } 18}} \quad 2A$$

$$2. \text{ Mean of the lowest temperatures} = \frac{16 \times 6 + 17 \times 11 + 18 \times 6 + 19 \times 6 + 20 \times 1}{30} \text{ } ^\circ\text{C} \quad 1M$$

$$= \underline{\underline{17.5^\circ\text{C}}} \quad 2A$$

$$\text{Median of the lowest temperatures} = \frac{17 + 17}{2} \text{ } ^\circ\text{C} \quad 1M$$

$$= \underline{\underline{17^\circ\text{C}}} \quad 2A$$

$$\text{Mode of the lowest temperatures} = \underline{\underline{17^\circ\text{C}}} \quad 2A$$

3. (a)

Height (cm)	Class mark (cm)	Frequency
130 - 139	134.5	3
140 - 149	144.5	17
150 - 159	154.5	40
160 - 169	164.5	28
170 - 179	174.5	12

5A

(b) (i) Mean height of the students

$$= \frac{134.5 \times 3 + 144.5 \times 17 + 154.5 \times 40 + 164.5 \times 28 + 174.5 \times 12}{100} \text{ cm}$$

1M

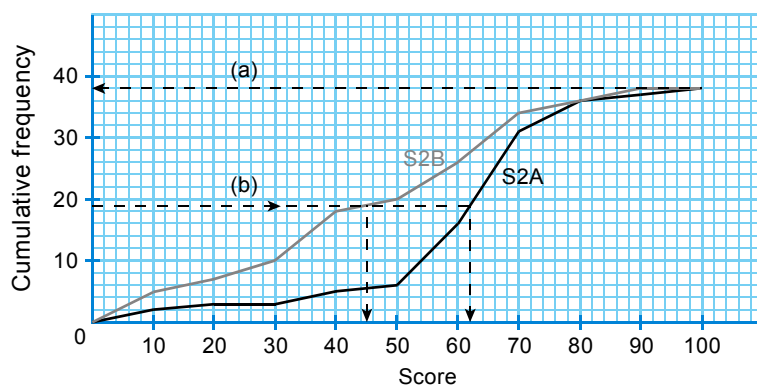
$$= \underline{\underline{157.4 \text{ cm}}}$$

2A

(ii) Modal class of the heights of the students = 150 cm - 159 cm

2A

4. Mathematics examination scores of S2A and S2B students



(a) From the graph,

the number of students in S2A = 38

1A

the number of students in S2B = 38

1A

(b) From the graph,

the median of the Mathematics examination scores in S2A = 62

2A

the median of the Mathematics examination scores in S2B = 45

2A

(c) S2A has a better Mathematics examination result.

2A

$$5. \text{ Mean} = \frac{\text{Sum of all the data}}{\text{Number of data}}$$

$$8.5 = \frac{4 + 6 + x + 3x}{4} \quad 2M$$

$$34 = 10 + 4x$$

$$4x = 24$$

$$x = \underline{6} \quad 2A$$

$$\text{Mean} = \frac{\text{Sum of all the data}}{\text{Number of data}}$$

$$9 = \frac{8 + x + 9 + y + 12}{5} \quad 2M$$

$$9 = \frac{8 + 6 + 9 + y + 12}{5}$$

$$45 = 35 + y$$

$$y = \underline{10} \quad 2A$$

6. Suggested answer:

Let  $a, b, c, d$  and  $e$  be the 5 numbers arranged in ascending order.

$\therefore$  The median is 10.

$\therefore c = 10$

$\therefore$  The mode is 12.

$\therefore$  At least two numbers are 12.

$\therefore d = e = 12$

$\therefore$  Mean = 8

$$\therefore \frac{a + b + 10 + 12 + 12}{5} = 8$$

$$a + b + 34 = 40$$

$$a + b = 6 \quad 1A$$

$\therefore a$  and  $b$  are both smaller than 10.

$\therefore$  Let  $a = 1, b = 5$ .

$\therefore$  The 5 numbers could be 1, 5, 10, 12 and 12.

} 2A

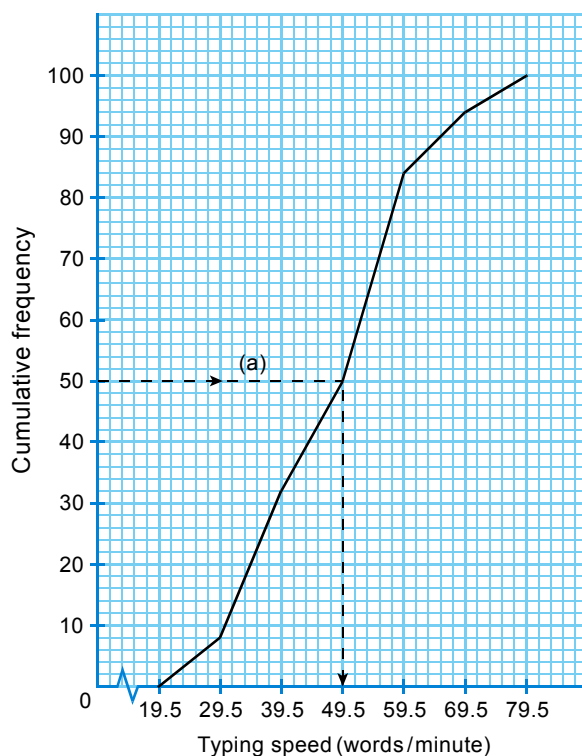
} 2A

1M

} 2A

2A

7. Typing speeds of 100 people



(a) From the graph, the median of the typing speeds = 49.5 words/minute

2A

(b) (i)

Typing speed (words/minute)	Class mark (words/minute)	Frequency
20 - 29	24.5	8
30 - 39	34.5	24
40 - 49	44.5	18
50 - 59	54.5	34
60 - 69	64.5	10
70 - 79	74.5	6

6A

(ii) Modal class of the typing speeds = 50 words/minute - 59 words/minute

2A

(iii) Mean typing speed

$$= \frac{24.5 \times 8 + 34.5 \times 24 + 44.5 \times 18 + 54.5 \times 34 + 64.5 \times 10 + 74.5 \times 6}{100} \text{ words/minute}$$

1M

$$= \underline{\underline{47.7 \text{ words/minute}}}$$

2A

(c) From the table in (b)(i), there are 16 people whose typing speeds are not lower than 60 words/minute.

2A

$$\begin{aligned} \therefore \text{ Required percentage} &= \frac{16}{100} \times 100\% \\ &= \underline{\underline{16\%}} \end{aligned}$$

1M



8. (a)  $\therefore$  The mean of  $p, q, r, s$  and  $t$  is 10.

$$\text{i.e. } \frac{p+q+r+s+t}{5} = 10$$

$$\therefore p+q+r+s+t = 50 \dots\dots\dots (1)$$

2A

$$\text{New mean} = \frac{(p-5) + (q-5) + (r-5) + (s-5) + (t-5)}{5}$$

2M

$$= \frac{(p+q+r+s+t) - 25}{5}$$

$$= \frac{50 - 25}{5} \quad [\text{From (1)}]$$

$$= \underline{\underline{5}} \quad \text{2A}$$

$$\text{(b) New mean} = \frac{3p+3q+3r+3s+3t}{5}$$

2M

$$= \frac{3(p+q+r+s+t)}{5}$$

$$= \frac{3 \times 50}{5} \quad [\text{From (1)}]$$

$$= \underline{\underline{30}} \quad \text{2A}$$

9. If the mean score is greater than 90, then

$$\frac{80+90+95+80+x}{5} > 90$$

3M

$$x + 345 > 450$$

$$x > 105 \quad \text{2A}$$

But  $x \leq 100$

2M

$\therefore$  The mean score of these 5 dictations cannot be greater than 90.

2A